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Indian Standard

MANGO SEED KERNEL (SOLVENT EXTRACTED) AS LIVESTOCK FEED INGREDIENT — SPECIFICATION

UDC 636·087·2

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NEW DELHI 110002

May 1990 **Price Group 2**

Livestock Feeds Sectional Committee, FADC 5

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards on 25 November 1989, after the draft finalized by the Livestock Feeds Sectional Committee had been approved by the Food and Agriculture Division Council.

Mango seed (*Mangifera indica*) kernel is an agro-industrial by product. Through extensive work, it has been established that this can be a rich energy source when used as an ingredient for livestock feed and thereby augment feed resources and improve nutritional standards of livestock.

In the preparation of this standard, due consideration has been given to the provisions of *Solvent Extraction Order*, 1975 and the Rules framed thereunder. However, this standard is subject to the restrictions imposed under these, wherever applicable.

Indian Standard

MANGO SEED KERNEL (SOLVENT EXTRACTED) AS LIVESTOCK FEED INGREDIENT — SPECIFICATION

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for solvent extracted mango seed (*Mangifera indica*) kernel meant for use as a livestock feed ingredient.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard:

IS No.	*Title*
1070 : 1977	Specification for water for general laboratory use (*second revision*)
3470 : 1966	Specification for hexane, food grade
4905 : 1968	Methods for random sampling
7874 (Part 1) : 1975	Methods of tests for animal feeds and feeding stuffs: Part 1 General methods.

3 REQUIREMENTS

3.1 Description

The solvent extracted mango seed kernels shall be obtained by extraction of oil by means of a solvent from the mango seed kernels. The solvent extracted mango seed kernels shall be subjected to heat and steam treatment under controlled and regulated condition so as to remove traces of solvent. The material shall be free from musty and stale odour, sour or rancid taste, dirt and extraneous matter. The material shall be free from visible fungal growth and insect infestation.

3.2 Solvent for Extraction

Only hexane of food grade conforming to IS 3470 : 1966 shall be used for extracting oil from mango seed kernels.

3.3 The material shall also conform to the requirements prescribed in Table 1.

4 PACKING AND MARKING

4.1 Packing

Unless otherwise agreed to between the purchaser and the vendor, the material shall be packed in sound jute bags lined with a layer of polyethylene or HDPE bags. The mouth of each bag shall be either machine stitched or rolled over and hand stitched with strong twine.

Table 1 Requirements for Solvent Extracted Mango Seed Kernels as Livestock Feed Ingredient

(*Clauses* 3.3, 6.1, A-4.2 *and* A-5.1)

Sl No.	Characteristics	Requirement	Method of Test, Ref to Cl No. in IS 7874 (Part 1) : 1975
(1)	(2)	(3)	(4)
i)	Moisture, percent by mass, *Max*	8·5	4
ii)	Crude protein (N × 6·25), percent by mass, *Min*	6·0	5
iii)	Crude fibre, percent by mass, *Max*	1·75	8
iv)	Total ash, percent by mass, *Max*	5·0	9
v)	Acid insoluble ash, percent by mass, *Max*	1·0	10

NOTE — The requirements for items (ii) to (v) are on moisture-free-basis.

4.2 Marking

Each bag shall be legibly and indelibly marked to give the following information:

a) Name of the material,
b) Name of the manufacturer,
c) Batch or code number,
d) Net mass in kg, and
e) Date of packing.

5 SAMPLING AND CRITERIA FOR CONFORMITY

5.1 The scale of sampling and criteria for conformity of the material to the requirements of this specification shall be according to the procedure given in Annex A.

6. TESTS

6.1 The tests shall be carried out by appropriate methods referred to in col 4 of Table 1.

6.2 Quality of Reagents

Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070 : 1977) shall be employed in the tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

ANNEX A

(*Clause* 4.1)

SAMPLING AND CRITERIA FOR CONFORMITY OF SOLVENT EXTRACTED MANGO SEED KERNEL AS LIVESTOCK FEED INGREDIENT

A-1 GENERAL REQUIREMENTS OF SAMPLING

A-1.0 In drawing, preparing, storing and handling samples, care should be taken such that the properties are not affected. The following precautions and directions shall be observed.

A-1.1 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

A-1.2 The sampling instrument shall be clean and dry when used.

A-1.3 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination.

A-1.4 The samples shall be placed in clean and dry glass containers. The sample containers shall be of such a size that they are almost completely filled by the sample.

A-1.5 Each container shall be sealed air-tight with a glass stopper or a suitable closer after filling in such a way that it is not possible to open and reseal it without detection and marked with full details of sampling, date of sampling, batch or code number, name of the manufacturer and other important particulars of the consignment.

A-1.6 Samples shall be stored in such a manner that there is no deterioration of the material.

A-1.7 Sampling shall be done by a person agreed to between the purchaser and the vendor and if desired by any of them, in the presence of the purchaser (or his representative) and the vendor (or his representative).

A-2 SCALE OF SAMPLING

A-2.1 Lot

All bags of the mango seed kernels extracted in one chamber under relatively similar conditions in a day shall constitute a lot.

NOTE — Relatively similar conditions would mean the use of raw materials having insignificant variations, similar conditions of manufacture, etc.

A-2.1.1 Samples shall be tested for each lot for ascertaining conformity of the material to the requirements of this specification.

A-2.2 The number of bags to be selected from the lot shall depend on the size of the lot and shall be in accordance with col 1 and 2 of Table 2.

A-2.3 The bags shall be chosen at random from the lot. In order to ensure the randomness of selection, procedures given in IS 4905 : 1968 may be followed.

Table 2 Number of Bags to be Selected for Sampling

(*Clauses* A-2.2 *and* A-3.1)

Lot Size	No. of Bags to be Selected for Sampling
(1)	(2)
Up to 50	3
51 to 100	4
101 to 300	5
301 to 500	6
501 and above	7

A-3 PREPARATION OF TEST SAMPLES AND REFEREE SAMPLES

A-3.1 Preparation of Individual Samples

Draw with an appropriate sampling instrument, equal quantities of the material from the top, bottom and the sides of each bag selected according to Table 2. The total quantity of the material drawn from each bag shall be not less than 1·5 kg. Mix all the portions of the material drawn from the same bag thoroughly. Take out about 0·75 kg of material and divide into three parts. Each portion, thus obtained, shall constitute the test sample representing that particular bag and shall be transferred immediately to clean and dry sample containers and sealed air-tight. These shall be labelled with particulars given under **A-1.5**. The individual samples obtained as above shall be formed into three sets in such a way that each set has a test sample representing each bag selected. One of the sets shall be for the purchaser, another for the vendor, and the third for the referee.

A-3.2 Preparation of Composite Samples

From the mixed material from each selected bag remaining after the individual samples have been taken, equal quantities of material from each bag shall be taken and mixed up together so as to form a composite sample weighing not less than 0·75 kg. This composite sample shall be dividend into three equal parts and transferred to clean and dry containers and labelled with the particulars given under **A-1.5** and sealed air-tight. One of these samples shall be for the purchaser, another for the vendor, and the third for the referee.

A-3.3 Referee Sample

Referee samples shall consist of a set of test samples (*see* **A-3.1**) and composite samples (*see* **A-3.2**) and shall bear the seals of the purchaser and the vendor and shall be kept at a place agreed to between the two so as to be used in case of a dispute.

A-4 TESTING OF SAMPLES

A-4.1 Tests for acid insoluble ash shall be conducted individually on each of the samples constituting a set of test samples (*see* **A-3.1**).

A-4.2 Tests for the remaining characteristics, prescribed in Table 1, shall be conducted on the composite sample (*see* **A-3.2**).

A-5 CRITERION FOR CONFORMITY

A-5.1 A lot shall be considered as conforming to the specification when the following conditions are satisfied:

a) The expression ($\bar{X} + 0{\cdot}4\,R$) is less than or equal to the maximum limit for acid insoluble ash given in Table 1,

where

$$\bar{X}\text{ (Mean)} = \frac{\text{Sum of the test results}}{\text{No. of test results}}$$

R (Range) = Difference in largest and smallest values of test results

b) The test results on the composite sample satisfy the other requirements specified in Table 1.

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